

BOOK REVIEWS

Temniskova, D. & Stoyneva, M. 2011.

**Algology, vol. 1. General Part (512 pp.),
vol. 2. Systematic Part (628 pp.).**

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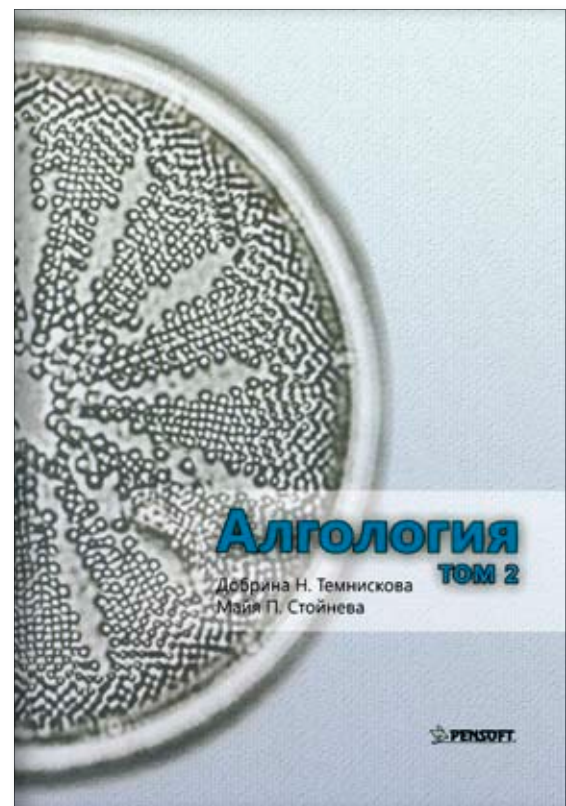
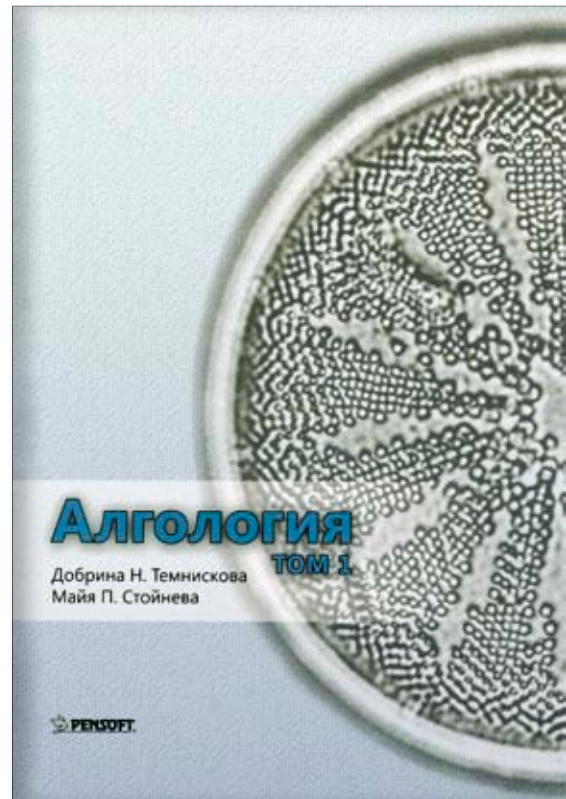
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Going deep into the wonderful world of algae

The book of Prof. Dobrina Temniskova, DSc and Prof. Dr Maya Stoyneva was recently brought out. The material is presented in two volumes, 1140 pages altogether. The work is illustrated with 485 figures. The authors intended it as a university handbook, wishing to bring to the students modern knowledge about the incredibly rich world of algae. However, even at a cursory glance one can see that it contains the latest data on algae, duly structured and presented. Thus, besides as a handbook for Bachelor's and Master's degrees, the book can be used as a monograph by advanced specialists in the field.

Across the centuries a trend has formed in the high education according to which university professors are not only researchers, but advanced specialists in a given scientific domain, with sufficient knowledge in the relevant scientific lines permitting them not only to present the special facts and cognition, but also to bind them into comprehensive knowledge. Therefore, a university professor, besides his scientific explorations, should be capable to explain in an accessible and engaging way the achievements of modern science. The authors of *Algology*, Prof. Temniskova and Prof. M. Stoyneva, set a good example in this respect. They combine successfully scientific competence with pedagogical skills to present modern knowledge on algae properly, with fine understanding of the peculiarities of this large and complex group of organisms.

The knowledge of algae has an enormous theoretical and practical importance, owing to the fact



that they underlay and mark the beginning of biological evolution. They form a many-sided and peculiar group. The higher algae, along with the fungi, are the first eukaryotes dealing with and approving the multicellular organization of living matter. Thus they came by the properties which enabled them to set a trend in structure sophistication, diversification of forms and enlargement of the size of organisms. The algae were and still are the primary producers involved in the photosynthesis and contributing to the increase of oxygen in the Earth atmosphere. This shows how important the science on algae – algology (phycology) – is as a part of botany.

The first volume of the book includes nine chapters devoted to general topics: recommendations how to use the handbook, concise history of algology, the fundamentals of biosystematics and biodiversity, concepts of the species, data on thalli, characteristics of the algal cells, data on reproduction and life histories, ecology of algae, importance of algae for mankind, etc.

In the beginning the authors provide recommendations how to use the handbook. This very useful pedagogical approach is intended to facilitate the readers' orientation at different levels of knowledge towards the data serving their specific interests. Each chapter contains obligatory text for reading, included in grey boxes, the acquaintance with which will be necessary to understand the following chapters and sections. The main terms and some data of supreme importance are given in bold. For the purpose of fast orientation, the classification is given on the inner cover of the first volume, where the four main evolutionary lines are outlined: blue-green, red, yellow-brown and green. Their characteristics are provided before the relevant divisions and classes united in the line. The Latin names in the examples are arranged alphabetically. Two types of print are used: normal print for the main narration and small print for the more narrowly specialized text, which explains some specific details of the topics. Some chapters and sections providing additional information for those who are interested in the relevant topic are rendered in small print. Some recommendations are outlined to help in orientation and use of the handbook for educational purposes.

An important Appendix for orientation in the history of algae is the latest version of the International

Stratigraphic Chart, provided in Bulgarian language on the inner cover of the second volume. It was published by the International Commission on Stratigraphy in 2009, although with a print error, citing Gradstein et al. (2004) and Ogg et al. (2008) as its authors.

The authors provide a large list of References on algae, an Index of Terms and an Index of Latin Names, very helpful for the reader.

The second volume is organized in 27 chapters. This is the systematic part of the book. Here I completely share the opinion of both authors that cyanophyceans belong to the world of algae, because of their more complicated structure in comparison to the bacteria and because of being represented by both uni- and multicellular forms, containing chlorophyll *a* and producing and releasing oxygen during the photosynthesis. That means that the blue-green algae in particular had played a fundamental role in the evolution of life on the Earth.

The rendition of material in the book is further enhanced by its structuring. This is particularly well illustrated by the systematics, where the authors present the separate groups of algae, uniting most of them in four main evolutionary lines, each characterized by common fundamental features. Thus, the blue-green evolutionary line is represented by prokaryotes, unified in the division Cyanoprokaryota and divided for didactic reasons into two classes: blue-green algae and pre-green algae (cyanoprokaryotes and prochlorophytes). The red evolutionary line covers the division Rhodophyta (red algae), divided into seven classes. The yellow-brown evolutionary line is represented by one division (Ochrophyta), but systematically this division is the most varied, it includes 14 classes. The green evolutionary line unifies two divisions and five classes, including the typical green algae (chlorophytes). Furthermore, six other small, independent evolutionary lines are also characterized.

Mention deserves the modern approach of the authors – the different systematic groups of algae are characterised in the light of a given evolutionary trend, on the basis of rich and varied data on algal morphology, cytology, biochemistry, and distribution of certain algal units, in combination with data on their evolution and phylogeny. Thus the reader gets an overall idea about the separate systematic al-

gal groups and about their history and evolutionary relations with close and similar groups as well. This helps avoid the “dryish” way of presentation so typical of most systematics and contributes to showing a plastic and flowing picture of evolutionary diversity in the world of algae.

Important is the modern approach of the authors to presenting, even synthetically, the latest data on the given systematic groups, including generalized data on fossil findings, trends and crucial moments of evolution, phylogenetic ties and ecology of algae. This is particularly obvious in the description of the oldest group of cyanophyceans (blue-green algae). According to the available fossil findings, these pioneers of life on the Earth are known for *ca.* 3.5 billion years B.P. as oncolithes and stromatolithes, for which the biogenic origin of carbon was proved.

It is known that rocks aged over 3.5 billion years are strongly metamorphosed dynamically and thermally and, therefore, they do not contain preserved organic cellular structures, but some chemical traces of life can be found in them. The chemical compounds indicative of life have been found in rocks 3.5 billion years old in the Dresser Formation in West Australia and, with less certainty, in rocks 3.8 billion years old in Greenland, where rare oncolithes have been found.

Actually, oncolithes are commonly spherical carbonate forms with a concentric multilayered structure, formed by consecutive deposits of blue-green algae. Their maximum dimensions do not exceed 10 cm. Stromatolithes are multi-layered carbonate forms, commonly with horizontal or convex texture, formed in shallow environment by blue-green algae and bacteria.

Very interesting for the early history of algae are the findings in Swaziland (Onverwacht, Fig Tree and Bulawayo formations) and especially the clear fossil remains of diverse unicellular organisms found in the Gunflint Formation (Ontario, Canada), including the filamentous algae determined as *Gunflintia minuta*, which are analysed by the authors. These findings are 2 billion years old and show in the prints of the filaments, at equal intervals, cells which look like the modern heterocysts.

Here is one more example in support of the modern approach of the authors to origin, evolution and phylogeny of the different algal groups; it deals with

the origin of the class Bacillariophyceae (diatoms). This is a most amazing group of algae, with the most organized and beautiful structures known in the living world; they could be found in various combinations and vast diversity in time and space.

Until recently, it was accepted that diatoms have been known since *ca.* 112 MA years (the end of Aptian and the beginning of Albian age of the early Cretaceous period). Some opinions claim even an earlier appearance for these algae and even name their age as Proterozoic. However, these opinions were based solely on assumptions, not on facts. Any hypothesis about the Proterozoic or early Proterozoic origin of diatoms fails to explain why these forms, in the structure of which silica plays a fundamental part, have not left any clear fossil traces for over 400 MA years. Such cases do not exist in the evolutionary chronicles. Thus the modern view of the authors on the origin of diatoms comes to the fore, according to which they appeared in the beginning of the Mesozoic period (Triassic). This opinion is supported not only by data about the Triassic origin of diatoms, but also by the picture of global change of the organic world that set in the beginning of the Mesozoic period and affected nearly all groups of the plant and animal world.

Algology not only presents the new data about the algae, but provokes many thoughts about the complicated and long history of the plant world, the origin, formation of peculiarities of the separate groups and their evolution, ecology and fundamental role of bi-systems and their diversity.

Undoubtedly, the readers now have access to a superb university handbook of a world mark. In fact, it is a monograph of encyclopedic nature – a modern encyclopedia in algology. The book is a result of the extraordinary scientific erudition and pedagogic experience of Prof. D. Temniskova, supported actively by Prof. M. Stoyneva, who has accepted willingly the baton of Bulgarian algology.

Undoubtedly, *Algology* by Prof. D. Temnsikova and Prof. M. Stoyneva rates and will remain among the highest achievements of Bulgarian Botany in 21st century.

Chytrý, M., Kučera, T., Kočí, M., Grulich, V. & Lustyk, P. (eds). 2010.

Katalog biotopů České republiky

(Habitat Catalogue of the Czech Republic). 2nd ed.

Agentura ochrany přírody a krajiny ČR. 445 pp. Hardback.
ISBN 978-80-87457-02-3 (in Czech with English summaries).

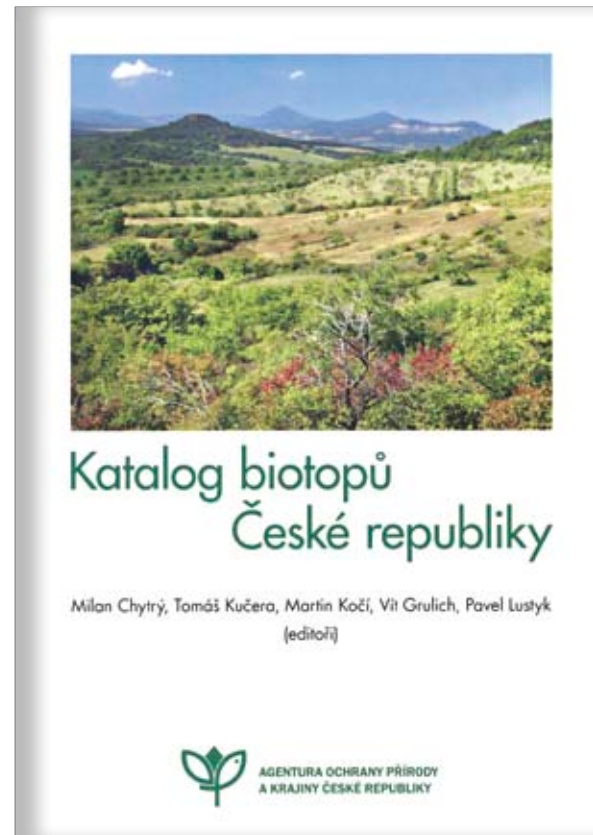
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The second edition of the *Habitat Catalogue of the Czech Republic* is a manual defining the units used for habitat mapping in the country. The first edition of the *Catalogue* was published in 2001. After its publication, an extensive habitat mapping program (2001–2004) was carried out in the Czech Republic organized by the National Agency of Nature Conservation and Landscape Protection. A parallel project of habitat monitoring based on permanent plots began in 2008. The system of phytosociological classification of the Czech vegetation has been extensively revised on the basis of the analysis of the Czech National Phytosociological Database.

This book is a revised edition, which expands the knowledge of the habitat and vegetation of the Czech Republic. In fact, it functions as a manual that defines the units used for habitat mapping in the Czech Republic. The system of the Czech habitat types is compatible with those presented in Annex I of the Habitats Directive (92/43/EEC). However, unlike the Annex I list, which includes only selected habitats of high conservation value, the Czech system of habitat classification is comprehensive: it contains all major habitat types occurring in the country and makes it possible to assign any site in the field to a particular habitat type. Therefore, the habitat classification presented in this *Catalogue* has been developed as a compromise between the Natura 2000 system and an adequate description of the Czech habitat types. It is appropriate for description and management of the Czech natural habitats, while along with this it is explicitly transferable into the classification used in Natura 2000. It is a good example of the organization of such work which could be applied also in Bulgaria.

The *Habitat Catalogue* is divided basically into nine groups of habitats, including: V streams and water bod-



ies; M wetlands and riverine vegetation; R springs and mires; S cliffs and boulder screes; A alpine treeless habitats; T secondary grasslands and heathlands; K. scrub; L forests; X habitats strongly influenced or created by men. Each group is subdivided into habitat units and subunits. There are a total of 140 habitat subunits and undivided units. The description of every habitat unit/subunit is accompanied with information about the corresponding units of Natura 2000 and Palaeartic classification, EUNIS, vegetation types, forest typology, and also typical species, ecological peculiarities, distribution in the country, management and threats. There is a precise map with grid cells 6×5.5 km. The *Catalogue* is amply illustrated with photographs of a very good quality.

For the Bulgarian botanists and phytocoenologists, the *Habitat Catalogue* sets a good example of comprehensive scientific team work of very high quality. The book could be also used by ecologists, zoologists, landscape specialists, students, and persons with broad interests in natural history and habitats.

Wörz, A. 2011.

Revision of *Eryngium* L. (Apiaceae-Saniculoideae): General Part and Palaeartic Species.

In: *Bibliotheca Botanica*, Vol. **159**. Schweizerbart Science Publishers (Nägele u. Obermiller), Stuttgart. 498 pp. Hardback. ISBN 978-3-510-48030-2, ISSN 0044-5088.

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The 159th volume of the *Bibliotheca Botanica – Original Contributions to Botany Series* (ISSN 0067-7892) was published in 2011. The Series has been published since 1886 and presents in-depth, reliable and original monographic contributions to botany, covering all plant groups. Volume 159 is devoted to *Eryngium* L. (*Apiaceae*) and is written by Arno Wörz.

Eryngium is the largest genus in *Umbeliferae* comprising about 220 species occurring in West Eurasia, North Africa, North and South America and Australia.

The monograph presents a comprehensive taxonomic treatment of the genus in Asia, Africa and Europe. The large-format volume comprises 498 pages, 84 figures, 41 tables and 12 plates (31×23 cm). The text is organised in two parts – General Part: Taxonomy, Biogeography and Evolution, and Systematic Treatment of the Species.

The General Part deals with the general morphology and the results of a cladistic analysis of *Eryngium* in comparison with the genetic data. Detailed information is provided on the history of illustration and research into *Eryngium*, on material and methods used (incl. nomenclature and herbarium studies, phytosociological methods, chromosome counting, fruit anatomical and petal morphological studies, cladistic and systematic studies), reproductive biology, taxonomic values of characters, classification and evolution of the genus, and keys for identification of subgenera, sections and species. The genus is divided into six subgenera: *E.* subgg. *Eryngium*, *Foetida*, *Lessonia*, *Monocotyloidea*, *Semiaquatica*, and the newly described *E.* subg. *Ilicifolia*.



The Special Part includes comprehensive treatment of 61 species. The species are arranged alphabetically by sections. Detailed information is provided for each species on the nomenclature, name derivation, morphology, infraspecific variability, chromosome number, molecular details, biology, relationships, distribution (incl. listing of the studied herbarium specimens and distribution maps, Fig. 1),

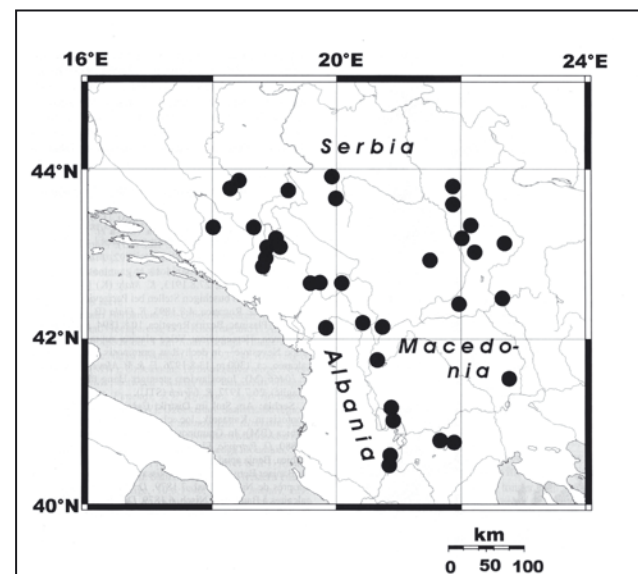


Fig. 1. Distribution map of *Eryngium palmatum*.

ecology (incl. relevés following the Braun-Blanquet method), illustrations (Fig. 2, incl. colour photographs supplemented at the end of the volume), populations and threat level, and chemical components and ethnobotany. Wherever necessary and possible, lectotypes have been designated. Hybrids are also treated.

The monograph is supplemented with lists of *nomina illegitima* and *nomina nuda* as well as References, Index Nominum, General Index, and Geographic Index. A list of all earlier published 158 volumes within the *Bibliotheca Botanica* Series is also provided at the end of the book.

Of special interest to the Balkan countries are 13 species which occur in different parts of the Balkan Peninsula and the Aegean Islands: *Eryngium alpinum* L., *E. amethystinum* L., *E. amorginum* Rech. f., *E. campestre* L., *E. creticum* Lam., *E. falcatum* F. Delaroche, *E. glomeratum* Lam., *E. maritimum* L., *E. palmatum* Pančić & Vis., *E. planum* L., *E. serbicum* Pančić, *E. ternatum* Poir., *E. wiegandii* Adamović.

The volume is based on extensive work on the herbarium specimens from more than 25 herbaria and is intended as a first part of a three-volume monograph. According to the author, he has devoted (and mostly enjoyed) 12 years of study into *Eryngium*, availing himself of the “still excellent working conditions in a natural history museum” where he is employed. This profound book will be of great interest to any researchers of the *Eryngium* species, including those engaged in local and regional floristic studies. It also sets an excellent example to plant taxonomists to follow in their own scientific work.

The book is available for orders at:
www.schweizerbart.com/9783510480302,
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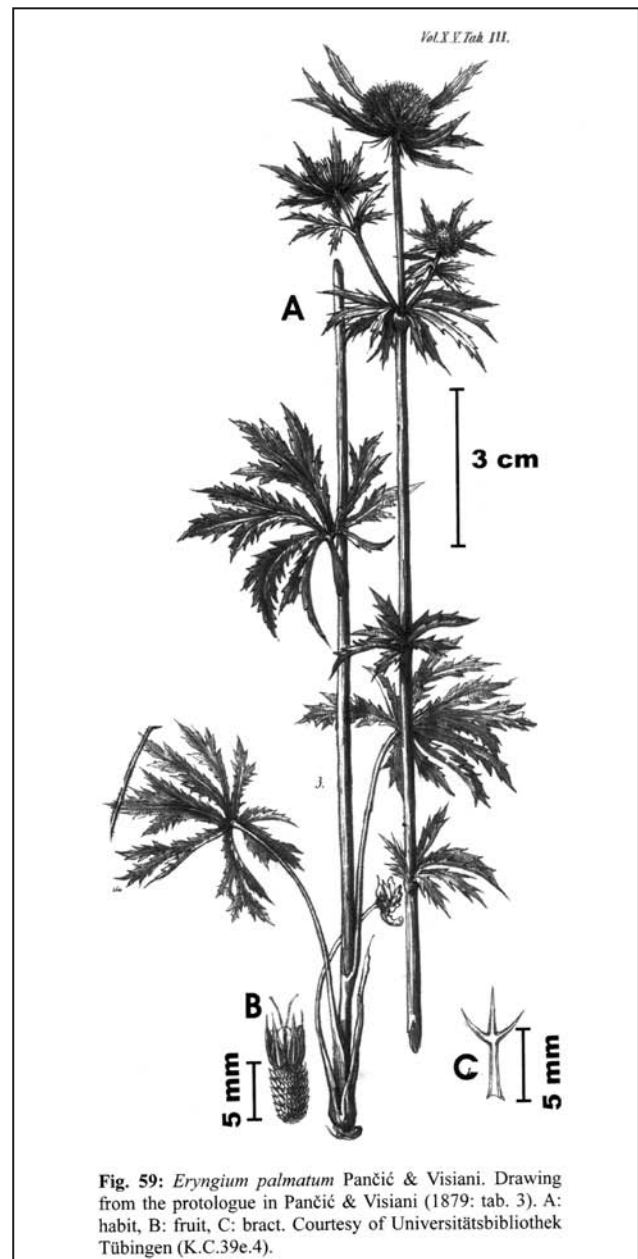


Fig. 59: *Eryngium palmatum* Pančić & Visiani. Drawing from the protologue in Pančić & Visiani (1879: tab. 3). A: habit, B: fruit, C: bract. Courtesy of Universitätsbibliothek Tübingen (K.C.39e.4).

Fig. 2. Illustration of *Eryngium palmatum*.

Sukhorukov, A.P. (ed.). 2010.

The Identification Manual of Vascular Plants of the Tambov Region

Grif & K, Tula. Hardback, 350 pp. ISBN 978-5-8125-1568-3 (in Russian)

AUTHORS: Sukhorukov, A.P., Balandin, S.A., Agafonov, V.A., Alexeev, Yu.E., Buzrnova, I.O., Efimov, P.G., Ivanenko, Yu.A., Lazkov, G.A., Lindeman, G.V., Luferov, A.N., Mavrodiev, E.V., Nilova, M.V., Sennikov, A.N., Tatanov, I.V., Khlyzova, N.Yu., Scholz, H., Scherbakov, A.V. & Yurtseva, O.V.

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The book is the first floristic work on the Tambov Region within its contemporary boundaries, resulting from the detailed studies of A.P. Sukhorukov in the period 1994–2010, as well as a critical analysis of the herbarium samples collected by various authors there. The Tambov Region lies in the middle of Central Russia. There have been **1478** species of vascular plants identified there, belonging to **114** families and **611** genera.

Structure of the book

General Section

The General Section of the book deals with the structure of the flora in the Tambov Region, including the:

- **natural flora and certain aspects of the florogenesis** – a concise overview of the development of flora testifying to the fact that the obtaining opinion about permanent development of the flora almost across the entire temperate zone of East Europe in the Quaternary and the existence of specific refugia in the Preglacial Period should be rejected, while at the same time the Central Russian forest and steppe flora should be regarded as a young formation (aged *ca.* 10 000–12 000 years).

The authors analyse the main reasons for the contemporary disjunctive spread of the species in the steppes and forest-steppes. The disjunctive character of the taxa areal is not necessarily connected to the relict character, nor should be the endemics viewed as “remnants of ancient floras”.



- **adventive flora** (alien species). It is noted that, as compared to other territories, the Tambov Region has been relatively well studied in respect to adventive species (archaeophytes and neophytes), which amount to *ca.* 400 species. The families *Gramineae*, *Cruciferae*, *Rosaceae*, *Leguminosae*, and *Compositae* are especially rich in such species. The modes and ways of penetration of these species into the territory are recorded, as well as their ability to get naturalized in the invaded habitats. Such habitats for most of adventive neophytes are the railway networks (*Erysimum repandum*, *Kochia scoparia*, *Plantago scabra*, *Cardaria draba*, etc.), or motorways as in the case of *Rumex patientia*, *Galega officinalis*, for others these are the natural plant

communities, which they assail (*Chaerophyllum aureum*, *Arrhenatherum elatius*, *Elodea canadensis*, *Juncus tenuis*, etc.).

Recorded are the most aggressive alien species in the last decade, which had made their way into the Region's habitats, like *Amaranthus powellii*, *Chaerophyllum aureum*, *Rumex patientia*, *Ambrosia trifida*, etc.

- **concise characteristic of the vegetation** – data on mixed and broad-leaved forests, steppe vegetation, halophyte communities, aquatic vegetation, and secondary vegetation are included too.

- **botanical and geographical regionalization of the Region** – six botanical and geographical regions are considered, with a brief characteristic and characteristic species for each of them. A map of the Region is included, with the boundaries of the different regions.

Special Section

This Section starts with a new **Identification Key to 114 Families** occurring on the territory of the Region, compiled on the dichotomous principle and based on combinations of characters as well as on the species distribution. The families and genera are presented according to the system of A. Engler. The generic names are preceded by their number according to Dalla Torre & Harms (1900–1907) put in square brackets. According to the authors, all this is intended to facilitate to the maximum the use of the Key by those who are already accustomed to such manner of arrangement.

Besides the Latin name, for every species is given also its Russian name, concise set of synonyms (if any), height of the plant, time of flowering (or sporulation), ecological specificities, and frequency of occurrence. For the extremely rare species, herbarium samples are also cited, as well as the name of the herbarium they are stored in (*Cephalaria litwinovii*, *Cypripedium calceolus*, *Hippophae rhamnoides*, *Middendorfia borystenica*, *Orchis militaris*, etc.).

Some species are included in the Key without number, because of their still unknown but highly proba-

ble distribution in the Region, or according to reports but without herbarium samples to support their certain distribution (*Axyris amaranthoides*, *Crepis biennis*, *Stelaria neglecta*, *Ranunculus polyrhizos*, *Salvia glutinosa*, *Artemisia annua*, *Trapa natans*, etc.).

A **new for science** species is also described from the territory (*Eragrostis voronensis* H. Scholz, p. 84).

The family *Asteraceae* is with the highest species richness: 60 genera and 185 species, followed by *Poaceae* – 54 genera and 134 species, *Brassicaceae* – 38 genera and 78 species, etc.

Illustrations

The text is accompanied by 158 colour photographs of the different species made by I.V. Tatanov and A.P. Sukhorukov. There are also 27 black-and-white drawings of the respective species, as well as 14 chorological maps of 75 species with a limited distribution in the Region.

The References comprise 305 titles. At the end of the book, there are alphabetically arranged indexes of the Latin and Russian names of the families and genera included in it.

The Manual provides a valuable information source about the flora on the territory of the Tambov Region, facilitating its knowledge. The keys for determination of various families and genera are professionally made and include the most characteristic morphological features of the species, which makes them easy and precise for work. Information on the distribution of species in that Region is important not only for local and Russian botanists, but for all concerned with the floristic studies and floristic diversity in other geographical territories. The book will be of use not only to expert botanists, but also to ecologists and friends of Nature.

The authors deserve congratulations for this work resulting from long years of research.